

on the economics of data and privacy

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privacy workshop

princeton & luohan academy

luohan academy report

- ▶ excellent overview of fundamentals underlying data & privacy.
- ▶ basic structure
 - ▶ understanding the demand for privacy
 - ▶ what is the value of data?
 - ▶ how is data different than bananas or accountants?
 - ▶ how should we regulate the data economy?
- ▶ insightful experiments conducted over a large sample.

outline

- ▶ implications for regulation:
 - ▶ should facebook have been allowed to buy instagram?
 - ▶ should google/ali baba be (global) data hubs?
- ▶ implications for modeling:
 - ▶ should 'we' think about asymmetric information differently?
 - ▶ an example using insurance markets.
- ▶ hey, but what is privacy?
 - ▶ is it a type or is it a social norm?
 - ▶ is it intrinsic or instrumental?

a tale of two takeovers

- ▶ at&t wanted to buy t-mobil in 2011 for \$39b.
 - ▶ doj challenged it, at&t abandoned the takeover.
 - ▶ cons: higher prices, fewer choices, and less innovation,
 - ▶ pros: increase network quality and improve balance sheets.
- ▶ fcc doc on the proposed merger:.

*commission staff finds that the applicants have failed... proving that the proposed transaction, on balance, will serve the public interest. upon careful examination... the staff concludes that significant **harms to competition** are likely to result, primarily in the form of **increased prices for consumers, reduced incentives for innovation, an decreased consumer choice...***

a tale of two takeovers

- ▶ facebook bought instagram in 2012 for \$1b
 - ▶ facebook was desktop oriented, instagram was a mobile app
 - ▶ no major regulatory blockade.
 - ▶ in 2019, instagram more than 1/4th of facebook's revenue
 - ▶ crudely makes instagram's market cap \$150b this morning!
- ▶ what is the tradeoff?
 - ▶ maybe consumer is better off matching data across platforms,
 - ▶ but that makes facebook a large monopoly.
- ▶ argue that the "transaction" doesn't fit the neo-class model.

facebook & google: the kill zone

year	parent	target	price in \$b
2006	google	youtube	1.65
2007	google	doubleclick	3.1
2009	google	admob	0.75
2009	google	postini	0.625
2011	google	ita software	0.67
2012	facebook	instagram	1
2013	google	waze	0.96
2014	facebook	whatsapp	19
2016	google	apigee	0.625

source: pitchbook, and kamepalli-rajan-zingales [2019]

let's theorize a bit

- ▶ how is facebook's takeover of instagram different?
 - ▶ two-sided platform, one faces advertisers, and other consumers,
 - ▶ the consumer side is priced at zero,
 - ▶ huge network effects on the consumer side, and
 - ▶ switching costs.
- ▶ 'standard' economics forces kaput?
 - ▶ how to measure "competition" in the absence of prices?
 - ▶ network effects push towards consolidation anyway?
- ▶ since "prices" continue to be zero, what's problem anyway?
 - ▶ maybe not internalizing the upstream/downstream markets?
 - ▶ innovation still a big issue, schumpeter turning in the grave.
- ▶ the politics of the day: brake 'em up!

what is special about the data economy?

- ▶ are data monopolies harder to regulate?
 - ▶ access to big data makes firms get constantly better
 - ▶ network effects are strong: more valuable with more customers.
- ▶ at least three issues:
 - ▶ evaluating efficiency, concentration, etc.
 - ▶ quantifying price discrimination,
 - ▶ privacy: what part of the data is being used and for what?
- ▶ perhaps standard approaches of break 'em up less desirable?
- ▶ is the solution (inter)national data repositories?
 - ▶ designing newer anti-trust laws,
 - ▶ partitioning data interesting computational and social problem.

what does this mean for modeling?

- ▶ all of this means an exciting timing for economists.
- ▶ since we are at drawing board stage (and 'data' is scare)
 - ▶ a good time to explore various models
 - ▶ a great opportunity for theory!

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- ▶ insurance markets where firm has greater statistical info.
- ▶ basic setup same as rothschild-stiglitz [1976].
- ▶ “state of the world” is 2-d: $\theta = (\theta_1, \theta_2)$ s.t. $\theta_i \in \{H, L\}$.
- ▶ extent of damage is given by μ_{ij} s.t.
 - ▶ $\mu_{HH} > \mu_{HL} > \mu_{LL}$,
 - ▶ $\mu_{HH} > \mu_{LH} > \mu_{LL}$.
- ▶ joint distribution of θ is given by $q = \{q_{HH}, q_{HL}, q_{LH}, q_{LL}\}$.

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		θ_2		
		L	H	
θ_1	L	q_{LL}	q_{LH}	q_1
	H	q_{HL}	q_{HH}	$1 - q_1$
		q_2	$1 - q_2$	

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		θ_2		
		L	H	
θ_1	L	$q_1 q_2 + \rho\sigma$	$q_1(1 - q_2) - \rho\sigma$	q_1
	H	$(1 - q_1)q_2 - \rho\sigma$	$(1 - q_1)(1 - q_2) + \rho\sigma$	$1 - q_1$
		q_2	$1 - q_2$	

- ▶ distribution is parametrized by (q_1, q_2, ρ) ,
- ▶ the stan dev is $\sigma = \sqrt{q_1(1 - q_1)}\sqrt{q_2(1 - q_2)}$.

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- ▶ q_1 and q_2 are publicly known.
- ▶ the agent privately knows θ_1 .
- ▶ the **principal privately knows ρ** .
- ▶ to “close the model”: $\rho \sim F$ on $[\underline{\rho}, \bar{\rho}]$.
- ▶ all this information is common knowledge.

but what is privacy?

- ▶ many axiomatically distinct/competing features.
- ▶ what's the micro foundation for its demand:
 - ▶ intrinsic: moral/ethical and hence evolutionary approach,
 - ▶ instrumental: fine as long as it not used against me monetarily.
- ▶ how to think about its manifestation:
 - ▶ is it a type, and hence exogenous,
 - ▶ is it a social norm, and hence endogenous.
- ▶ might help to
 - ▶ clarify the privacy paradox,
 - ▶ inform the parameters of new anti-trust laws.

notable omissions from the discussion

- ▶ theoretically
 - ▶ multidimensional attributes,
 - ▶ equilib model of demand & supply of privacy in data economy.
- ▶ data, privacy, and authoritative repression
 - ▶ identification is typically at the core of a fascist project,
 - ▶ big debate in india around biometrics for national id.
- ▶ change in the structure of human interactions
 - ▶ online dating,
 - ▶ role of local communities,
 - ▶ incentivizing good behavior through a "social credit system",
 - ▶ political correctness and wokeness: everything is online.